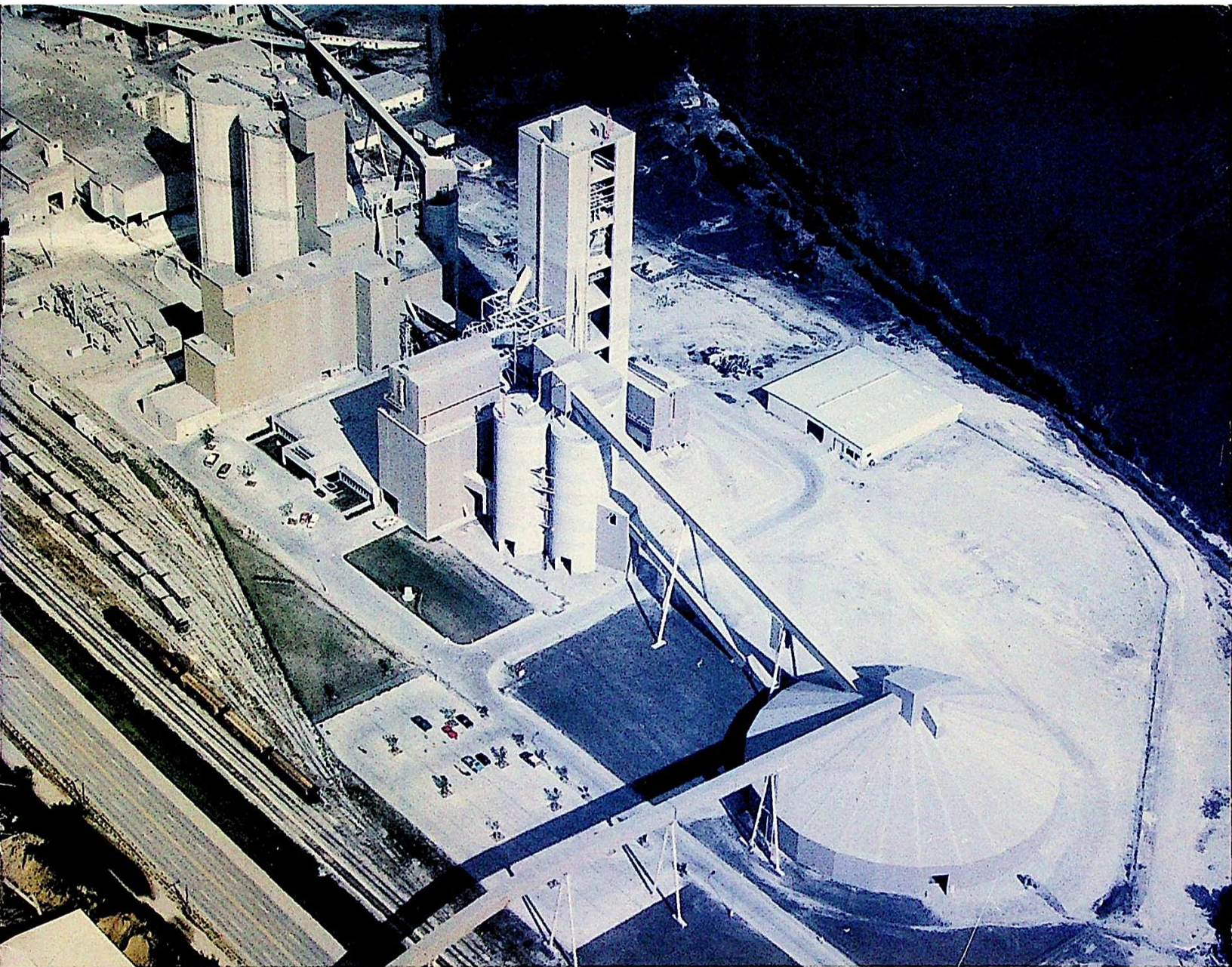
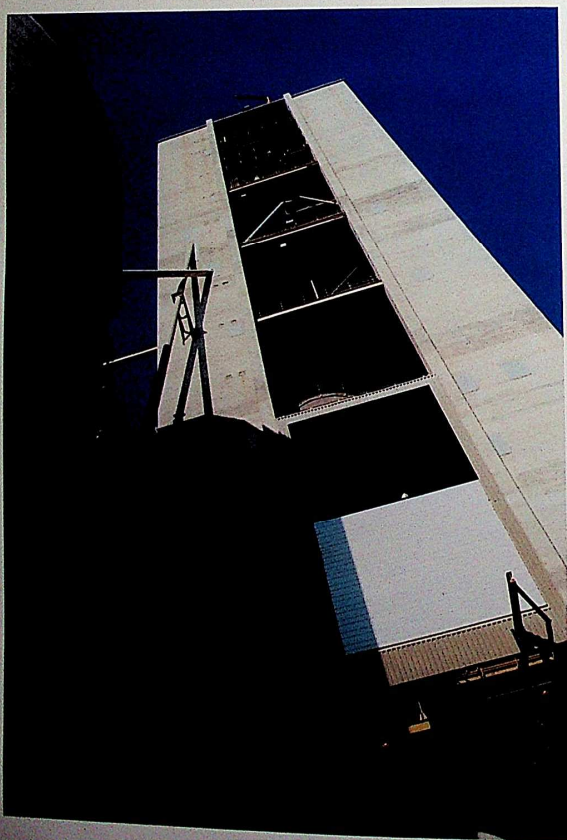




Davenport Cement Company

Buffalo, Iowa Cement Plant



Welcome

Your interest in Davenport Cement Company's plant at Buffalo, Iowa is sincerely appreciated.

The facility has its origins in a cement plant built on this site in the late 1920's. The present-day plant of Davenport Cement Company was completed in December, 1981 at a cost in excess of \$80 million and embodies the highest technological advancements in the cement industry. Through a manufacturing conversion of natural resources, the plant produces various Portland cements including ASTM types I, IA, III and Masonry Cement.

With its kiln operating at full capacity, the plant can produce 850,000 tons of finished cement per year to serve the construction needs of the upper Midwest in proximity to the Mississippi River.

The primary focus of the facility's design is high-quality products with strict attention to energy conservation and adherence to environmental considerations.

We are proud of this most modern of cement-producing facilities. But we are even more proud of the talent and commitment of Davenport Cement Company people who manage, operate and maintain the plant and distribute its products.

It is our hope that this brochure will be useful and informative in describing our operations.

Davenport Cement Company
Davenport, Iowa

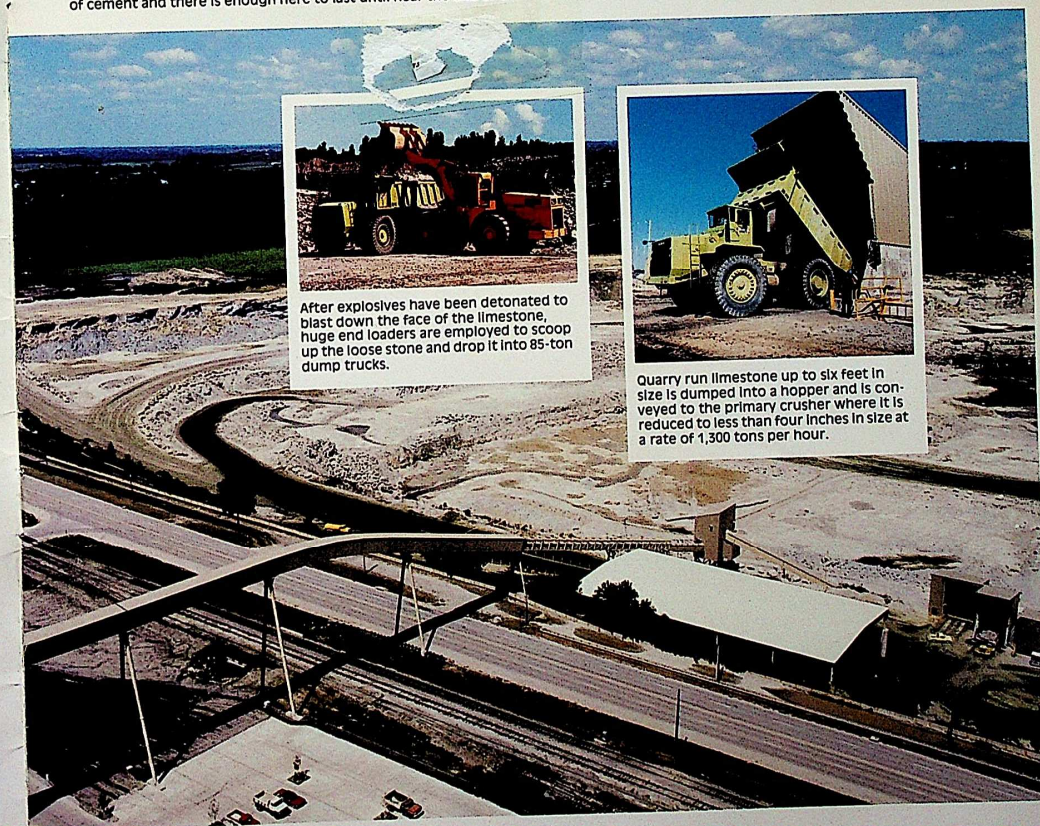
Davenport Cement Company's facility is a dry process, preheater/precalciner type plant employing in excess of 125 hourly and salaried people and producing 3.4 tons of cement per manhour. Situated on an 800-acre site, the plant was designed by Raymond/Kaiser Engineers, Inc. and was built in slightly over two years time utilizing 21 local and 6 out-of-town contracting firms. More than 45,000 cu. yds. of concrete and

5,000 tons of steel were used in construction.

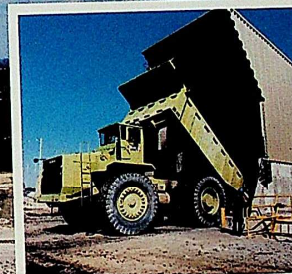
The type of fuel employed at the plant is low sulphur coal barged in on the adjacent Mississippi River. Fuel consumption is 3.3 million BTU's per ton of product. Electrical consumption is 140 KWH per ton of product.

The quality of cement produced is assured by nine quality control check points throughout the plant.

Cement begins here in the quarry. This stone belongs to the Wapsipinicon and Cedar Valley formations of the Middle Devonian Age (400 million years ago). It takes 1.7 tons of stone to make one ton of cement and there is enough here to last until near the end of the 21st century.

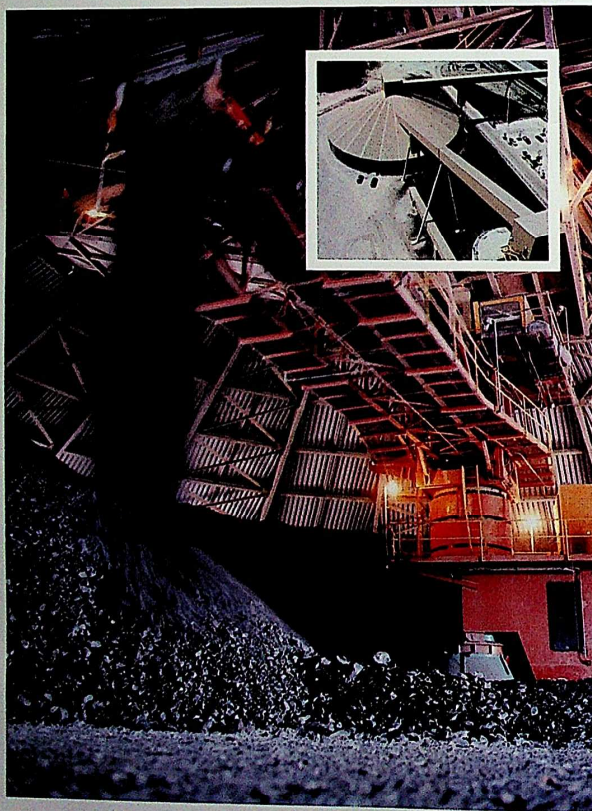


After explosives have been detonated to blast down the face of the limestone, huge end loaders are employed to scoop up the loose stone and drop it into 85-ton dump trucks.

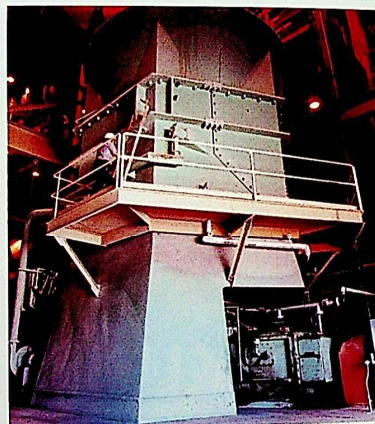


Quarry run limestone up to six feet in size is dumped into a hopper and is conveyed to the primary crusher where it is reduced to less than four inches in size at a rate of 1,300 tons per hour.

A belt conveyor takes material from the crusher overhead across Highway 22 to the 85 ft. high, 230 ft. diameter pre-blender dome. Inside the dome, which has a storage capacity of 15,000 tons, equipment blends limestone and clay. Traveling in an arc, a stacker automatically creates a uniform pile of material. Meanwhile, a reclaimer rakes the face of the pile in a radial, back and forth motion that causes material to flow into a conveyor which takes it to a surge bin for feeding the roller mill.



The roller mill, with a capacity of 230 tons per hour, crushes material up to 4 inches in size down to a fine powder suitable for kiln feed. At the same time, the rock is dried from about 4% moisture content to 1/2% moisture content.

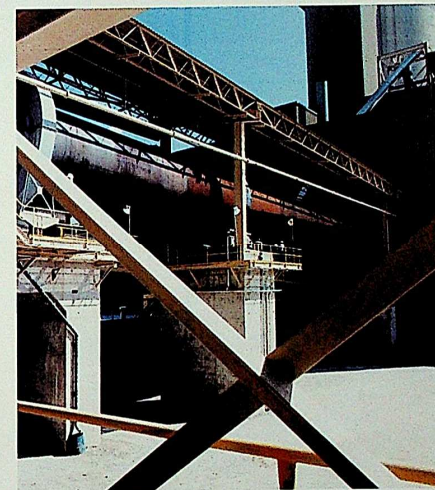


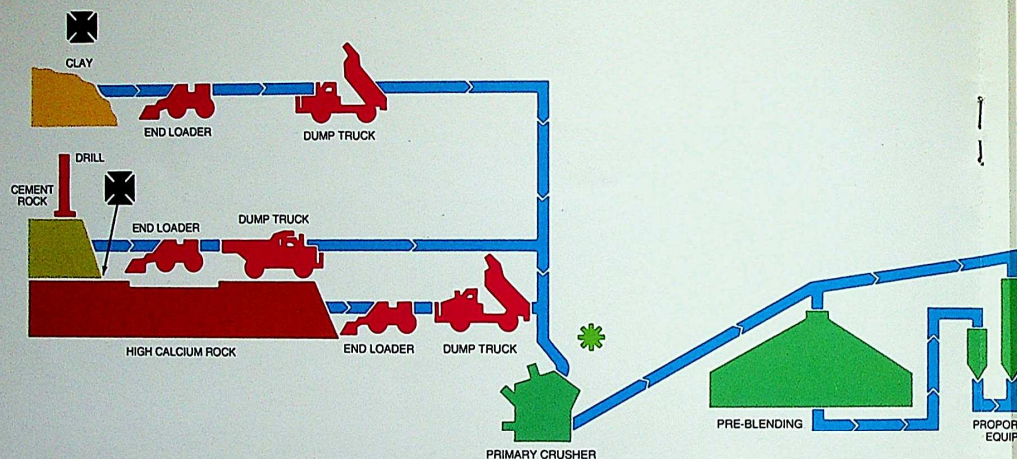
This CRT and keyboard, one of three such stations in the console room, comprise the digital computer center for process and motor control of the entire plant.

Inside the preheater/precalciner tower, raw meal is heated to 1660°F. It oxidizes (called calcining) into a powdery material. Ninety percent of the calcining is done inside this 320 ft. tall tower, one of the tallest structures in Iowa.



The rotary kiln is coal-fired and measures 197 ft. long by 13 ft. in diameter. The remaining ten percent of the calcining is performed within the kiln and the material is burned to clinker at temperatures reaching 2700°F at the discharge end (see picture below).





EXTRACTING

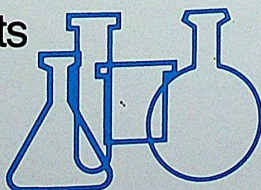
Top soil and clay or "overburden" are removed with end loaders. Drills then bore holes into which explosives are inserted and raw materials are blasted out, loaded, hauled, crushed and conveyed to storage.

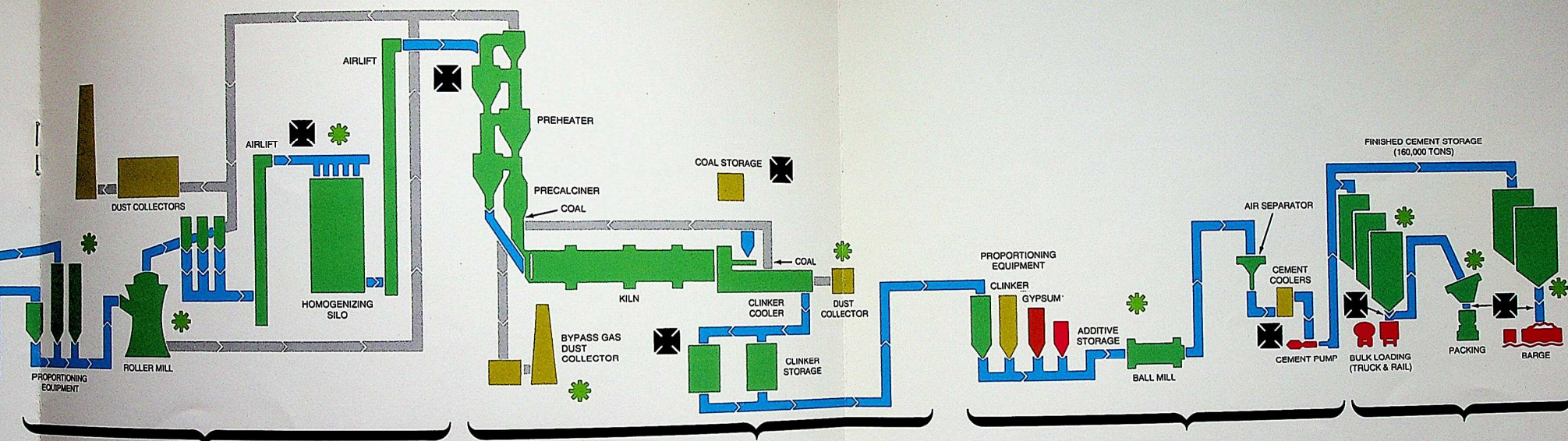
RAW MATERIALS CHEMICAL ANALYSIS			
	Clay	Cement Rock	High Calcium
SiO ₂	71.5	8.1	2.5
Al ₂ O ₃	11.6	2.1	0.6
Fe ₂ O ₃	4.8	1.5	.4
CaO	2.2	44.2	52.2
MgO	1.3	3.2	1.2
Approx. Usage	15%	60%	25%



Quality control check points

Cement manufactured to Davenport Cement Company standards requires "round the clock" sampling and analysis from raw materials through finished cement. Check points and "know how" assure a finished product meeting Davenport Cement standards.





RAW GRINDING

Pulverized stone is proportioned into a roller mill, ground, blended with clay, sized and transported to the homogenizing silo for mixing and storing. Kiln feed material is reclaimed at the bottom and conveyed to the preheater at a controlled rate.

BURNING

The pulverized stone and clay mixture entering the preheater kiln is dried, calcined and reacted to clinker at 2700° F using pulverized coal as fuel.

PRODUCT ANALYSIS		
Before Burning		After Burning
SiO ₂	14.3	C ₃ S 55 Tri Calcium Silicate
Al ₂ O ₃	2.4	C ₂ S 20 Di Calcium Silicate
Fe ₂ O ₃	1.5	C ₃ A 6 Tri Calcium Aluminate
CaO	42.7	C ₄ AF 7 Tetra Calcium Aluminoferrite
MgO	1.67	

FINISH GRINDING

Clinker and gypsum (and other additives as necessary) are proportioned to a ball mill, ground, sized in an air separator, finished cement is cooled and pumped to storage.

PACKING & SHIPPING

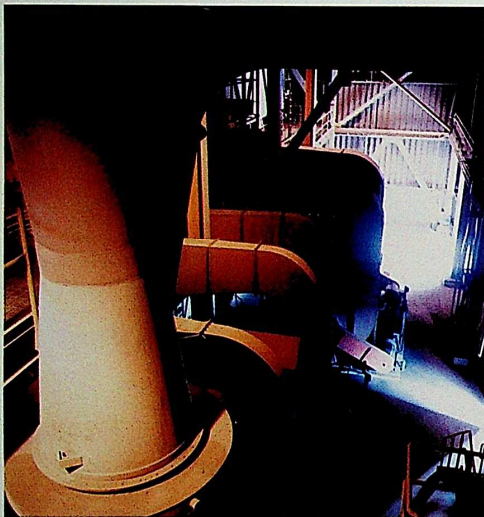
Cement is withdrawn from storage to fill customer orders, and is packaged or bulk loaded in rail cars, trucks or barges.

Davenport Cement Company

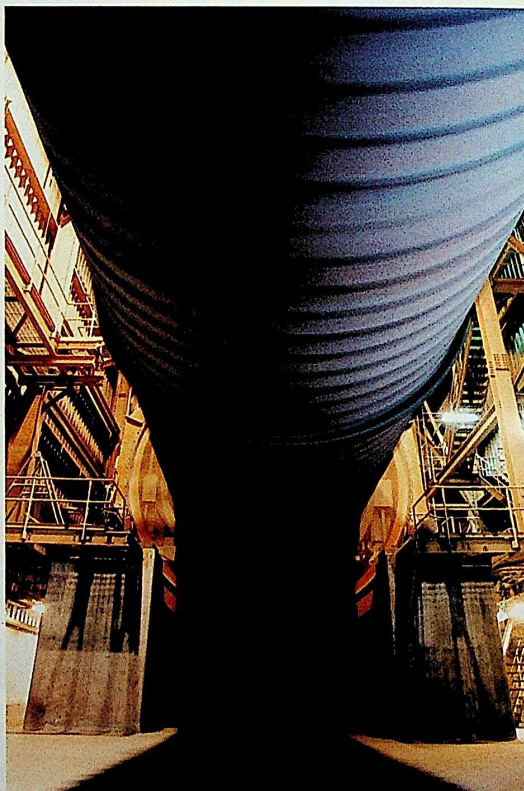
Environmental control check points

The best available control techniques have been employed to assure the plant to be in strict compliance with all current state and federal air quality standards.

After discharge from the rotary kiln, clinker moves on air-quenching movable grates through the clinker cooler. The clinker is cooled to a temperature where it can be hand held by forcing ambient air supplied by eight fans upward through the grates. The whole system is automatically controlled.



The finish mill is a 51 ft. long, 15 ft. diameter, two-compartment ball mill driven by two 3,500 HP motors. It has a capacity of 150 tons per hour. The finish mill is part of the last stage of cement making which includes proportioning and intergrinding of clinker and gypsum into finished cement and conveying it to storage silos.



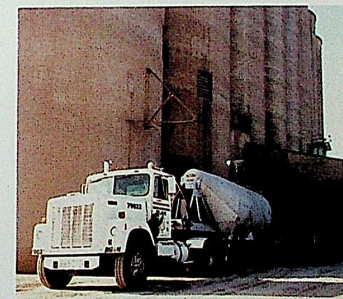
In the plant laboratory, samples of various finished cement types undergo spectrometer x-ray to determine their properties. A resultant computer print-out gives detailed analysis of content.



Operator loads magnetic tape into computer with programs for operating process and motor control of cement plant facilities. The system employs dual computers so that failure of any one function will automatically allow other functions to continue with undiminished performance.



Plant offices are located in this attractive, one-story, 22,185 sq. ft. building constructed of pre-cast concrete. The building includes offices for plant administrative and clerical personnel, laboratory, central control and computer rooms, lunchroom and locker facilities.



The Pack & Ship Department can load as many as 200 bulk cement tanker trucks per day from its storage silos. At adjacent facilities, bulk cement shipments also are loaded into railway cars and packaged cement is loaded into trucks.

The world of Cementia

DAVENPORT CEMENT COMPANY is a part of the Cementia Group through one of its affiliates, Cementus AG of Zug, Switzerland. The Cementia Group has been involved in the cement industry as far back as 1865 when the partners built a Portland cement factory in Beocin on the Danube River. Cement produced from Beocin marl was, however, already used in the 1840's for the construction of the first permanent bridge over the Danube between Buda and Pest. In 1913, the Beocin factory, with its capacity of 450,000 tons annually, was one of the largest plants on the Continent. Subsequently, factories were established in Croatia, Hungary, Czechoslovakia and Austria, all originally part of the Austro-Hungarian Monarchy. Cementia Holding AG was formed in 1921 with the aim of creating a central nucleus for these plants.

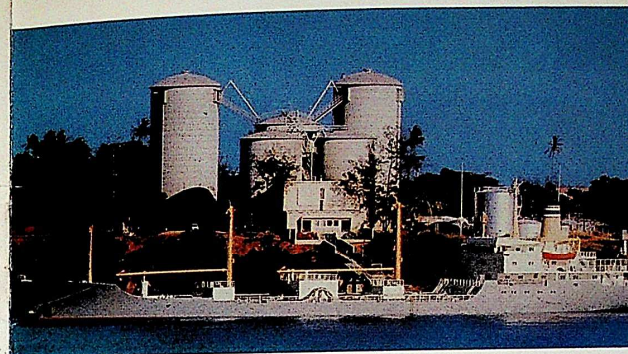
After World War II, however, all factories of the Group were nationalized with the exception of a participation in Perlmöoser Zementwerke AG, Vienna, Austria's leading cement producer. A new chapter in Cementia's activities

started in 1951 with the construction of a small cement factory in Kenya near Mombasa. From then on, further plants and industrial participations followed in Europe, East and West Africa, South America and Southeast Asia.

The present installed annual capacity of the industries with which Cementia is associated totals about 16 million tons. Basically, Cementia is a holding company. It supports the members of its Group with technical, managerial and financial assistance. Technical assistance is made available to clients by two subsidiaries: CEMPLAN, Cementia Planungs & Beratungs AG, Zurich, for mechanical and electrical engineering and CIPAG, Cementia Industrieplanung AG, Salzburg, for civil engineering. Trading and shipping interests are concentrated in Marine Cement Ltd., Zug, Switzerland.

CEMENTIA HOLDING AG

Nuschelerstrasse 45
CH-8001 Zurich/Switzerland
Telex: 812 863 Telephone: 221 25 33



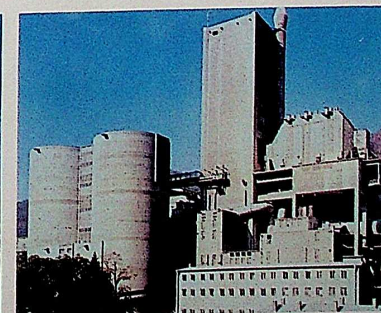
Silo station at English Point, Mombasa, Kenya of Bamburi Portland Cement Co., Ltd.



Factory of Bamburi Portland Cement Co. Ltd., Mombasa, Kenya

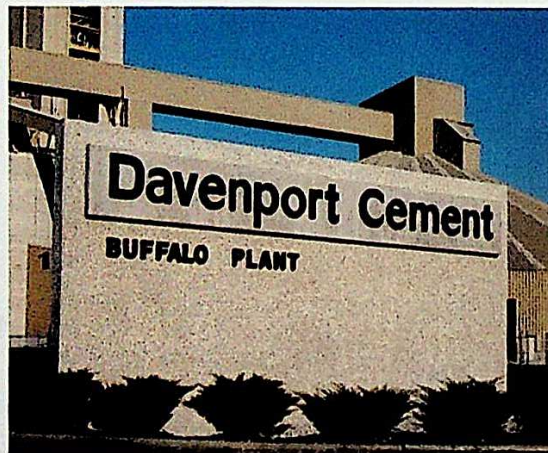
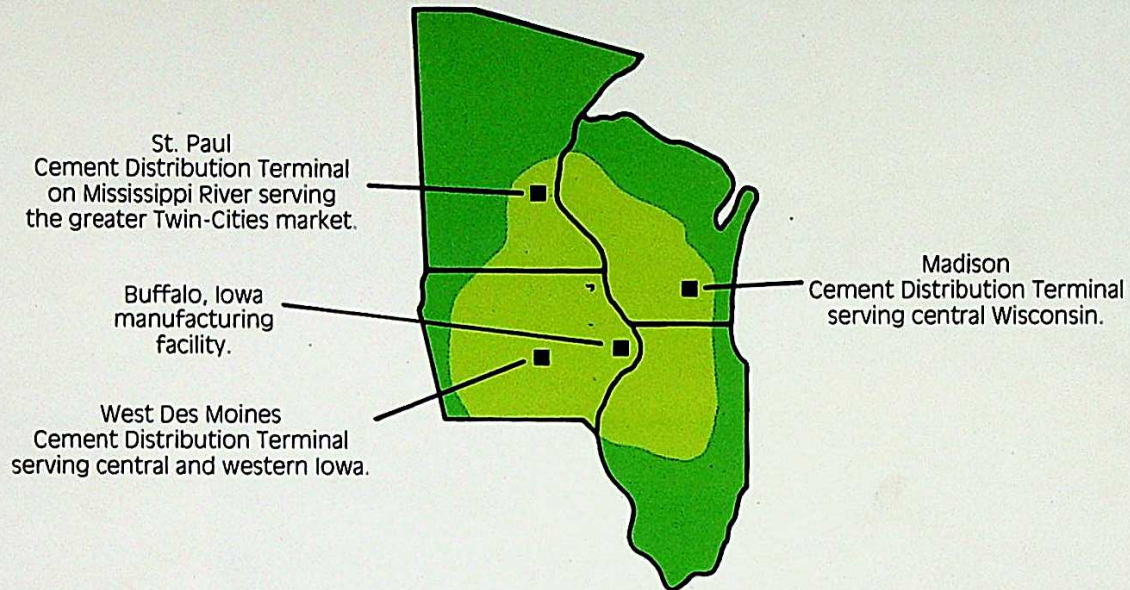


Cimento Tupi S.A. factory at Pedra do Sino, Minas Gerais, Brazil



Rodaun factory of Perlmöoser Zementwerke AG, Vienna, Austria

MARKET TRADE SERVICE AREA



Davenport Cement Company, 606-A Davenport Bank Building
Telephone (319) 323-2751 Telex 297828
P.O. Box 4288, Davenport, Iowa 52808

Terminals: 4124 Sycamore Avenue, Madison, WI 53705 • Telephone (608) 244-5658
2145 Child Road, St. Paul, MN 55106 • Telephone (612) 772-2497
P.O. Box 65757, West Des Moines, IA 50265 • Telephone (515) 225-7171